The following summarizes Preferred Alternative impacts to wetland sites 12A, 22, 35 and 42. These sites were not identified as being impacted by the Preferred Alternative within the 1996 FEIS. No substantive changes have occurred to the remaining wetland areas as to what was presented in the 1996 FEIS.

Wetland Site 12A

Wetland 12A is located south of 159th Street in close proximity to the east edge of Gougar Road. This 0.12 hectare (0.3 acre) wet meadow was not identified within the 1992 Wetland Report. It is a palustrine, emergent, seasonally flooded (PEMC) marsh. The June 2000 wetland delineation update found the site to contain no standing water but to exhibit soil characteristics suggesting a water table at or near the ground surface. Wetland plant species were present, but the site did not meet the criterion to warrant determination of a Foristic Quality Index (FQI). A small portion, 3.3 percent of the wetland lies in the required right-of-way. The Preferred Alternative will result in a loss of 0.004 hectares (0.01 acres) to Wetland 12A. The loss will be dependent on the improvements made to the intersection of Gougar Road with 159th Street with maximum loss to not exceed 0.004 hectares (0.01 acres). No functional changes are anticipated.

Wetland 22

Wetland 22 is a 0.41 hectares (1.02 acre) palustrine, emergent (PEM) marsh located to the east of IL Route 171 and south of 143rd Street. The June 2000 update found standing water at this site to a depth of 0.6 meters (2 feet). Wetland plant species were present, but the site did not meet the criterion to warrant determination of an FQI.

The Preferred Alternative will impact 19.6 percent, 0.08 hectares (0.20 acres) of Wetland 22. However, the actual wetland loss will depend upon the type of improvements to 143rd Street, with a maximum loss of 0.08 hectares (0.20 acres). The drainage area for this wetland is less than 0.65 square kilometers (0.25 square miles) and is bound by 143rd Street and a tributary of Long Run Creek. Reduction in this drainage area will occur as a result of improvements to 143rd Street. Some functional loss (sediment and nutrient trapping) is expected with the filling that will be needed.

Wetland 35

Wetland 35 is a 0.12 hectare (0.29 acre) marsh located south of New Avenue and east of State Street. It is an intermittently exposed, palustrine wetland with an unconsolidated bottom (PUBG). The June 2000 update found standing water at this site to a depth of 0.6 meters (2 feet). The site was significantly altered by recent earth moving activities. Wetland plant species were present, but the site did not meet the criterion to warrant determination of an FQI. The Preferred Alternative will result in a 100 percent loss of Wetland 35 and its associated flood storage, sediment and nutrient trapping, and migrating waterfowl habitat functions.

Wetland 42

Wetland 42 is a 16.9 hectare (41.6 acre) wetland located between Bluff Road and the Des Plaines River and between the River and the Chicago Sanitary and Ship Canal. It is a marsh classified as PEMF, PSS1/EMF PFOIC. In the 1996 FEIS, it was classified as a part of the Wetland 43 complex. The June 2000 wetland delineation update found stand-

ing water at this site to a depth of 0.6 to 1.2 meters (2 to 4 feet). Wetland plant species were present, but the site did not meet the criterion to warrant determination of an FQI. The Preferred Alternative will result in a 6.1 percent loss, 1.03 hectares (2.54 acres), to Wetland 42. The loss will be caused by construction of a detention pond ("stilling basin") and electrical transmission tower foundations within Wetland 42. The detention pond will collect drainage from the bridge. The tower foundations will be constructed for the relocation of four Commonwealth Edison high voltage transmission towers. Two foundations will be constructed on each side of the bridge.

Former Wetland Losses

Wetlands formerly listed as impacted in the 1996 FEIS, but which are no longer impacted by the Preferred Alternative are as follows. The changes in the impacted wetlands are due mostly to the shifting of wetland boundaries over the last eight years; in addition, development and erosion have caused changes to develop in the drainage patterns and dominant species.

Wetland 2

The area previously reported to be Wetland 2, located west of Gougar Road and south of Bruce Road, no longer meets the criterion for wetland hydrology. Drainage improvements that occurred over the past eight years to this site have resulted in the elimination of the wetland classification.

Wetland 12

Wetland 12, located north of 163rd Street, adjacent to the east edge of Gougar, is a 0.51 hectares (1.25 acre) palustrine, emergent, seasonally flooded (PEMC) wet meadow. The site no longer lies within the right-of-way.

Wetland 13

Wetland 13 is located south of 159th Street and east of the Preferred Alternative. The wetland is 0.45 hectares (1.10 acres). The wetland pond is intermittently exposed with an unconsolidated bottom (PUBGx). Since the 1992 Wetland Delineation, the site has been completely denuded and disturbed by earth moving activities. The wetland no longer lies within the Project Corridor. No areas will need to be filled.

Wetland 23

This 0.47 hectare (1.15 acre) floodplain forest/wet shrubland is located just south of 143rd Street and occurs at the edge of the 143rd Street right-of-way. This site no longer lies within the required right-of-way. No functional changes are anticipated.

Wetland 25

Wetland 25 is a 0.16 hectare (0.40 acre) wet shrubland/forbland (previously classified as a sedge meadow) just north of 143rd Street. The site no longer lies within the required right-of-way. Sediment trapping functions will not be lost.

Wetland 26

This 0.18 hectare (0.44 acre) pond is located northwest of the intersection of 139th Street and IL Route 171. Over the eight years since the time of the last wetland delineation, the boundaries of this wetland pond have changed due to significant shrub encroachment. The wetland no longer lies within the required right-of-way. No functional or vegetation loss is anticipated.

4.10.4 Operational Impacts

No substantive change has occurred to Operational Impacts since publication of the 1996 FEIS. Refer to 1996 FEIS, Section 4.10.3.2 for details on the operational wetland impacts.

4.10.5 Cumulative Impacts

No substantive change has occurred to Cumulative Impacts since publication of the 1996 FEIS. Minor changes are addressed in Section 4-20, Secondary and Cumulative Impacts of this 1996 FEIS. Refer to 1996 FEIS, Section 4.10.3.3 for details on the cumulative wetland impacts resulting from operations.

4.10.6 Avoidance Alternatives

There were no alignments that avoided all wetland impacts. The Preferred Alternative was chosen to minimize impacts to wetlands. The Preferred Alternative, a refinement of the original proposed alignments, fills approximately 3.93 hectares (9.7 acres) of wetland. Refer to 1996 FEIS, Section 4.10.3.4 for more information on the Avoidance Alternatives.

4.10.7 Measures to Minimize

To minimize construction impacts, the ISTHA Standard Specification Section 107.23 will apply. These include temporary runoff diversions with sedimentation controls to be used to capture sediment laden runoff from the construction area. Mulch barriers, hay bales and silt filter fences may be used to capture additional overland flow leaving the construction area that does not enter the runoff diversions.

Bridging wetlands in the Des Plaines River Valley minimizes the area directly filled and reduces changes in hydrologic characteristics of the affected wetlands. Drainage from the bridge will be directed via piping to a wet detention basin in the Des Plaines River Valley. Also, an old trail is being utilized to minimize the construction impacts and permanent loss of area in Wetlands 42 and 43. Mitigation measures are also described in Section 4.23.3. Where practicable, no construction equipment maintenance will be allowed within the wetlands.

4.10.8 Wetland Compensation

As with the 1996 FEIS, the wetland mitigation for the project will be derived from three sources; two locations along the Spring Creek floodplain and the Lockport Prairie Nature Preserve. The total mitigation acreage required has changed due to the decrease in the total wetland hectares (acres) impacted by the Preferred Alternative and a change in the replacement ratios used to calculate total mitigation area.

The first area of mitigation is located along Spring Creek. It is 6.68 hectares (16.5 acres) in area and satisfies Section 404 of the Clean Water Act.

The second area occurs within the Lockport Prairie Nature Preserve and satisfies agreements with the U.S. Fish and Wildlife Service (USFWS) and the Forest Preserve District of Will County (FPDWC). Since publication of the 1996 FEIS, work on this site has been completed and approved by ACOE, USFWS and FPDWC for the restoration of the Lockport Prairie site. In a letter dated July 25, 1997 from the Army Corps of Engineers to the Illinois State Toll Highway Authority, 1.52 hectares (3.75 acres) of the 6.07 hectares (15.0 acres) site were credited for wetland mitigation. Appendix D contains a copy of this letter.

Table 4-2
Application of State Wetland Mitigation Ratios[a] to Impacted Wetlands in the Project Corridor

Wetland No.	Hectares (Acreage) Lost	On-Site Mitigation Requirement©		Off-Site Mitigation Requirement©	
		Ratio	Hectares (Acreage)	Ratio	Hectares (Acreage)
1	0.43 (1.06)	2.5	***1.027 (2.650)***	4.0	1.716 (4.240)
6	0.28 (0.70)	2.5	***0.708 (1.750)***	4.0	1.133 (2.800)
8	0.34 (0.83)	2.5	0.840 (2.075)	4.0	***1.344 (3.320)***
9A[b]	0.01 (0.03)	5.5	0.067 (0.165)	5.5	***0.067 (0.165)***
9D	0.05 (0.13)	1.5	0.079 (0.195)	2.0	***0.105 (0.260)***
10	0.004 (0.01)	1.5	***0.006 (0.015)***	2.0	0.008 (0.020)
12A	0.004 (0.01)	1.5	***0.006 (0.015)***	2.0	0.008 (0.020)
16	0.21 (0.51)	2.5	***0.516 (1.275)***	4.0	0.826 (2.040)
18 [b]	0.05 (0.13)	5.5	***0.289 (0.715)***	5.5	0.289 (0.715)
22	0.08 (0.20)	1.5	***0.121 (0.300)***	2.0	0.162 (0.400)
30	0.04 (0.10)	1.5	***0.061 (0.150)***	2.0	0.081 (0.200)
33	0.73 (1.80)	2.5	***1.821 (4.500)***	4.0	2.914 (7.200)
35	0.12 (0.29)	1.5	***0.176 (0.435)***	2.0	0.235 (0.580)
37	0.06 (0.16)	1.5	***0.097 (0.240)***	2.0	0.129 (0.320)
41	0.31 (0.76)	2.5	***0.769 (1.900)***	4.0	1.230 (3.040)
42	1.03 (2.54)	2.5	***2.570 (6.350)***	4.0	4.112 (10.160)
43	0.05 (0.12)	1.5	***0.073 (0.180)***	2.0	0.097 (0.240)
44	0.13 (0.32)	1.5	***0.194 (0.480)***	2.0	0.259 (0.640)
Total:	**3.93 (9.70)**		**9.47 (23.39)**		**14.71 (36.36)**

a) Procedures for the Interagency Wetland Policy Act effective May 6, 1996.
b) Wetland Sites 9A and 18 have Floristic Quality Indices greater than 20.
c) The italicized combination of on-site and off-site mitigation areas represent the proposed mitigation area of 10.01 hectares (24.75acres) for the Project Corridor.

IDOT, ISTHA, FPDWC and IDNR are working together to develop the third mitigation area along Spring Creek east of Gougar Road. An additional 1.8 hectares (4.5 acres) will be located there. Table 4-2 presents the required mitigation for the Project Corridor. The calculations for mitigation required for the Preferred Alternative are presented in the 2000 Wetland Technical Delineation Report completed by Plocher and Tessene.

4.10.9 Floodplains

No substantive change in impacts has occurred to this resource since publication of the 1996 FEIS. Refer to the 1996 FEIS, Section 4.10.4 for a description of resource impacts.

4.10.10 Impacts to Seeps

No substantive change in impacts has occurred to this resource since publication of the 1996 FEIS. Refer to the 1996 FEIS, Section 4.10.5 for a description of resource impacts.

4.10.11 Permits

No substantive change in impacts has occurred to this resource since publication of the 1996 FEIS. Refer to the 1996 FEIS, Section 4.10.6 for a description of resource impacts.

4.11 Biological Resources

4.11.1 Vegetation and Cover Types

No substantive change in impacts has occurred to this resource since publication of the 1996 FEIS. Refer to the 1996 FEIS, Section 4.11.1 for a description of resource impacts.

Construction Impacts

No substantive change in impacts has occurred to this resource since publication of the 1996 FEIS. Refer to the 1996 FEIS, Section 4.11.1.1 for a description of resource impacts.

Agricultural Lands

No substantive change in impacts has occurred to this resource since publication of the 1996 FEIS. Refer to 1996 FEIS, Section 4.11.1.1 for a description of resource impacts.

Uplands, Shrublands and Forblands

No substantive change in impacts has occurred to this resource since publication of the 1996 FEIS. Refer to the 1996 FEIS, Section 4.11.1.1 for a description of resource impacts.

Des Plaines River Valley

No substantive change in impacts has occurred to this resource since publication of the 1996 FEIS. Refer to 1996 FEIS, Section 4.11.1.1 for a description of resource impacts.

Operational Impacts on Vegetation

No substantive change in impacts has occurred to this resource since publication of the 1996 FEIS. Refer to the 1996 FEIS, Section 4.11.1.2 for a description of resource impacts.

Landscape Restoration

No substantive change in impacts has occurred to this resource since publication of the 1996 FEIS. Refer to the 1996 FEIS, Section 4.11.1.3 for a description of resource impacts.

4.11.2 Impacts to Wildlife

No substantive change in impacts has occurred to this resource since publication of the 1996 FEIS. Refer to the 1996 FEIS, Section 4.11.2 for a description of resource impacts.

Birds

No substantive change in impacts has occurred to this resource since publication of the 1996 FEIS. Refer to the 1996 FEIS, Section 4.11.2.1 for a description of resource impacts.

Mammals

No substantive change in impacts has occurred to this resource since publication of the 1996 FEIS. Refer to 1996 FEIS, Section 4.11.2.2 for a description of resource impacts.

Reptiles and Amphibians

No substantive change in impacts has occurred to this resource since publication of the 1996 FEIS. Refer to 1996 FEIS, Section 4.11.2.3 for a description of resource impacts.

4.11.3 Threatened and Endangered Species

Illinois Natural History Survey (INHS) field review (INHS, 1998) for federal and state listed threatened and endangered species found no threatened or endangered species beyond those observed in the 1996 FEIS surveys. For those species, minor variations in species density were observed, however, no new potential effects to habitat or populations were identified. Refer to 1996 FEIS, Section 4.11.3.

Updated findings for federally and state listed threatened and endangered species observed within the I-355 South Extension alignment by the INHS surveys conducted for the SFEIS are as follows.

Federally-listed Species

The 1996 FEIS identified the potential effects of the Preferred Alternative on the federally listed leafy prairie clover (*Dalea foliosa*) and the Hine's emerald dragonfly (*Somatochlora hineana*). (Refer to the 1996 FEIS, Section 4.11.3.1.) The U.S. Fish and Wildlife Service provided an opinion in 1995 that the project would not affect the leafy prairie clover. In November 1995, the Service concurred that no adverse effects to the Hine's emerald dragonfly were likely as a result of the Preferred Alternative. The Concurrence opinion was predicated on pre, during and post-construction studies for the dragonfly and salt spray studies. The pre-construction phase of the dragonfly studies have been ongoing since 1995 and serve as a basis for the 1999 Dragonfly Recovery Plan. The results of these studies are summarized in Section 2 of the 1996 FEIS, the Dragonfly Recovery Plan (June 1999), INHS reports and the Illinois State Water Survey Report titled, "Atmospheric Dispersion Study of Deicing Salt Applied to Roads (April 2000)". The results of these pre-construction studies re-confirmed that the Preferred Alternative as planned would not adversely effect the Hine's emerald dragonfly.

State-listed Species

The 1996 FEIS documented the following state listed species: spotted turtle (*Clemmys guttata*), great egret (*Ardea alba*), king rail (*Rallus elegans*), black-crowned night heron (*Nycticorax nycticorax*), double-crested cormorants (*Phalacrocorax auritus*), pied-billed grebe (*Podilymbus podiceps*), common moorhen (*Gallinula chloropus*), osprey (*Pandion haliaetus*), brown creeper (*Certhia americana*), cooper's hawk (*Accipiter cooperii*), northern harrier (*Circus cyaneus*), Hine's emerald dragonfly (*Somatochlora hineana*), white lady's slipper (*Cypripedium candidum*), slender sandwort (*Arenaria patula*) and sedge (*Carex crawei*).

The 1998 INHS field review found no occurrence of state listed threatened or endangered species or habitat beyond those documented in the 1996 FEIS. For those listed species

documented in the 1996 FEIS, INHS staff found no significant impact has occurred to this resource since that publication. Refer to the 1996 FEIS, Section 4.11.3.2 for a description of resource impacts.

4.12 Air Quality

4.12.1 Introduction

The air quality analysis for the Preferred Alternative was prepared in accordance with procedures contained in the Illinois Department of Transportation (IDOT) Air Quality Manual, dated May 1982. These procedures were adopted as standards after coordination with the Illinois Environmental Protection Agency (IEPA), Division of Air Pollution Control, and the Federal Highway Administration, Illinois Division Office. The analysis is consistent with the latest mobile source emission factors issued by the U.S. Environmental Protection Agency known as MOBILE 5b and Conformity Regulations dated November 11, 1993, (40 C.F.R Parts 51 and 93) "Criteria and Procedures for Determining Conformity to State or Federal Implementation Plans, Programs, and Projects Funded or Approved Under Title 23 U.S.C. or the Federal Transit Act" and the IDOT and IEPA Agreement on Microscale Air Quality Assessments (Refer to Appendix C; IDOT and IEPA Agreement on Microscale Air Quality Assessments). The Chicago area, including the Project Corridor, is a severe ozone non-attainment area.

Carbon Monoxide Analysis

"Worst Case" Location Determination

As specified in the IDOT Air Quality Manual, carbon monoxide (CO) concentrations were calculated for a "Worst Case" site for the years 2001 (Existing), 2005 (Estimated Time of Completion - TOC), 2015 (Ten Years after Time of Completion) and 2020 (Design Year). A "Worst-Case" receptor is defined theoretically as a location along the roadway segment with the highest traffic volumes and lowest average speeds on the Preferred Alternative alignment and nearest to a high volume crossroad. The Project Corridor was evaluated to identify the sensitive receptors closest to the existing and recommended facilities, which best satisfy these criteria.

Using IDOT methodology, two intersection locations were initially analyzed for being the "Worst Case". These sites were analyzed using 2020 traffic volumes. Based on this analysis, the intersection at 143rd Street was determined to be "Worst Case" and the other intersection (127th Street) was eliminated from further consideration.

In addition to the intersections, air quality analysis was also performed for the I-55/I-355 interchange and the toll plaza along the Preferred Alternative. These sites were also analyzed using 2020 traffic volumes.

Eight-Hour Carbon Monoxide Concentrations

The concentrations for the "Worst Case" provided in Tables 4-3a through 4-3c indicate that the National Ambient Air Quality Standards (NAAQS) will not be exceeded for carbon monoxide for either the Preferred or the No-Action Alternatives. Consequently, no

substantial impact would result from construction of the Preferred Alternative. The 8-hour primary standard for CO is 9.0 parts per million (ppm).

One-Hour Carbon Monoxide Concentrations

No substantive change has occurred to this resource since publication of the 1996 FEIS. Refer to 1996 FEIS, Section 4.12.2.3.

4.12.2 Other Pollutants

Volatile Organic Compounds and Oxides of Nitrogen

Volatile Organic Compounds (VOCs) are reactive with each other and other atmospheric constituents and impurities and, in the presence of sunlight, they produce ozone (O_3). These photochemical reactions are dependent upon the amount of pollutants (e.g. VOC, NO_x, O_3) present in the atmosphere as well as the amount and intensity of sunlight present on any given occasion. As a result, the actual effect of the pollutants will not be observed in the vicinity of the Preferred Alternative, but rather at some considerable distance from the source. As the pollutants are transported, the problem is further complicated by the contributions of reactive pollutants from other sources both fixed and mobile.

The challenges of quantifying VOCs and NO_x from mobile sources to ambient ozone concentrations have been discussed between IDOT and IEPA. An agreement has been made to best reflect current air quality practices. IDOT and IEPA agree that total pollutant burden analysis for both hydrocarbons and nitrogen oxides is no

Table 4-3a
8-Hour Carbon Monoxide Concentration (ppm) for Worst Case Location at 143rd Street Intersection

Year	No-Action Alternative	Preferred Alternative
2001	3.2	-
2005 (Time of Completion)	3.2	3.4
2015 (Time of Completion + 10 years)	3.4	3.5
2020 (Design Year)	3.5	3.9

Source: COSIM Model Results, December 2000

Table 4-3b
8-Hour Carbon Monoxide Concentration (ppm) for Worst Case Location at I-55

Year	No-Action Alternative	Preferred Alternative
2001	3.0	-
2005 (Time of Completion)	3.0	3.0
2015 (Time of Completion + 10 years)	3.0	3.3
2020 (Design Year)	3.1	3.4

Source: CAL3QHC Model Results, July 2000

Table 4-3c
8-Hour Carbon Monoxide Concentration (ppm) for Worst Case Location at Mainline Toll Plaza

Year	No-Action Alternative	Preferred Alternative
2001	3.0	-
2005 (Time of Completion)	3.0	4.0
2015 (Time of Completion + 10 years)	3.0	3.9
2020 (Design Year)	3.0	4.1

Source: CAL3QHC Model Results, December 2000

longer necessary if the Proposed Action is included in the most recent conforming TIP and meets all the conformity analysis requirements. (Refer to Appendix C for the IDOT and IEPA Agreement on Microscale Air Quality Assessments.)

The staff at the Chicago Area Transportation Study (CATS) did perform an emission analysis for the Preferred Alternative utilizing the same process that is used for the TIP and RTP air quality conformity analysis. These calculations use the most current emission rates (from the 2000 conformity analysis) and are based on VMT by speed by vehicle type tables. The results of this analysis are summarized in Table 4-4.

Table 4-4
Emission Analysis

Airport	Network	VOC tonnes/day (tons/day)	NOx tonnes/day (tons/day)	Vehicle Miles Traveled (killometers/miles)
Existing Airports	RTP Build	99.38 (109.55)	151.20 (166.67)	211,063,137
	2020 No-Action	100.14 (110.39)	150.86 (166.29)	212,028,899
South Suburban Airport	RTP Build	100.05 (110.29)	152.62 (168.23)	215,827,798
	2020 No-Action	101.30 (111.66)	152.62 (168.23)	216,201,429

Source: Chicago Area Transportation Study, Year 2020 Traffic Volumes

As shown, the impact on emissions from the Preferred Alternative is negligible for both VOC and NOx. As such, the impact of the Preferred Alternative on ozone levels in the northeastern Illinois area is insignificant and no additional urban airshed analysis is necessary. The Illinois Environmental Protection Agency concurs in this finding. Refer to Appendix C for IEPA letter of concurrence dated December 2000.

The Preferred Alternative is included in the 2000 Edition of the 2020 Regional Transportation Plan (RTP) and in the analysis for the FY 2001-06 Transportation Improvement Program (TIP), endorsed by the Chicago Area Transportation Study (CATS), the Metropolitan Planning Organization (MPO). Projects in the TIP are considered to be consistent with the 2020 RTP endorsed by CATS. On November 2, 2000, the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) determined that the 2000 Edition of the 2020 RTP conforms to the State Implementation Plan (SIP) and the transportation-related requirements of the 1990 Clean Air Act Amendments. On November 2, 2000, the FHWA and the FTA determined that the TIP also conforms to the SIP and the Clean Air Amendments. These findings were in accordance with 40 C.F.R Part 93, "Criteria and Procedures for Determining Conformity to State or Federal Implementation Plans of Transportation Plans, Programs and Projects Funded or Approved Under Title 23 USC or the Federal Transit Act."

The Preferred Alternative's design concept and scope are consistent with the project information used for the TIP conformity analysis. Therefore, this project conforms to the existing State Implementation Plan and the transportation-related requirements of the 1990 Clean Air Act Amendments.

4.12.3 Measures to Minimize Impacts

No substantive change has occurred to this resource since publication of the 1996 FEIS. Refer to 1996 FEIS, Section 4.12.5.

4.13 Noise

4.13.1 Introduction to Noise

One decibel (dB(A)) is the smallest change in sound level an average person can detect under ideal conditions. Usually, an observer cannot notice an increase in noise of 3 to 4 decibels if the increase takes place at a uniform rate over several years. To an average listener, a difference of 10 dB(A) is perceived half as loud or twice as loud.

The equivalent, steady-state noise level, L_{eq} is used to analyze traffic noise levels and identify noise impacts. L_{eq} is defined as the sound level which, in a stated period of time, contains the same acoustic energy as the time varying sound level during the same period.

4.13.2 Regulations and Policies

Federal Regulations

The Federal Highway Administration (FHWA) policies and procedures, 23 C.F.R 772, served as the procedural guidelines in the analysis. Incorporated into the regulations are Noise Abatement Criteria (NAC), which are based on the type of land use and activities performed at the respective sites (See Table 4-5). The FHWA NAC defines impacts only. Abatement is examined and evaluated after traffic noise impacts have been identified at those locations. At residences and schools, for example, noise abatement must be considered an equivalent steady state level of 67 A-weighted decibels (dB(A)) for an hourly period is approached or exceeded. Traffic noise impacts also occur if there are substantial increases in noise over existing conditions, independent of the NAC.

State Policy

In implementing the FHWA 23 C.F.R, Part 772 regulations, the Illinois Department of Transportation developed the current Noise Analysis Policy dated April 3, 2000. This policy will be Section 26-6 in the IDOT Bureau of Design and Environment Manual and defines traffic noise impacts to occur under the following circumstances:

- Design-year traffic noise levels are within 1 dB(A) of or exceed the NAC.
- Design-year traffic noise levels are greater than 14 dB(A) above existing traffic-generated noise levels.

Noise abatement must be considered at receptors where predicted traffic noise impacts occur. For this study, all development platted prior to April 1999 have been considered for analysis.

4.13.3 Traffic-Generated Noise Levels

Seventy receptors were selected as representing their surrounding area. The locations of these receptors are shown in Exhibit 2-14 in Chapter 2. These receptors represent farmhouses, single-family residences and areas in the Des Plaines River Valley. Noise levels obtained at these sites are used to assess impacts for nearby sites with similar characteristics (i.e. distance to the alignment, traffic volumes, location relative to Project Corridor).

Table 4-5
FHWA Noise Abatement Criteria Hourly A-Weighted Sound Levels – Decibels (dB(A))

Activity Category	$L_{eq}(h)$	Description of Activity Category
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (Exterior)	Public areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (Exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D	--	Undeveloped lands.
E	52 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

Leq(h) – The hourly value of Leq. Leq is the equivalent steady-state sound level, which in a stated period of time contains the same acoustical energy as the time-varying sound level during the same period. For purposes of measuring or predicting noise levels, a receptor is assumed to be at ear height, located five feet above ground surface.

Use of interior noise levels shall be limited to situations where exterior noise levels are not applicable, i.e., where there are no exterior activities to be affected by traffic noise, or where exterior activities are far from or physically shielded from the roadway in a manner that prevents an impact on exterior activities.

Note: The Noise Abatement Criteria are noise impact thresholds for considering abatement. (Abatement must be considered when predicted traffic noise levels for the design year approach [i.e., are within 1 decibel of] or exceed the noise abatement criteria, or when the predicted traffic noise levels are substantially higher [i.e., are more than 14 decibels greater] than the existing noise level.) The Noise Abatement Criteria are not attenuation design criteria or targets. The goal of noise abatement measures is to achieve a substantial reduction in future noise levels. The reductions may or may not result in future noise levels at or below the Noise Abatement Criteria.

Source: Federal-Aid Policy Guide, Federal Highway Administration, 23 C.F.R, Part 772 (incorporated in IDOT BDE PROCEDURE MEMORANDUM, Number: 18-00, Subject: Procedures for Highway Project Noise Analysis, Date: April 3, 2000)

The year 2020 traffic-generated design-year noise levels were predicted using the FHWA Traffic Noise Model, TNM. The previous study used 2010 design-year traffic derived from ADT's (Average Daily Traffic) and was modeled with FHWA STAMINA 2.0 (previous noise model). Predicted values are based upon such considerations as roadway configuration, design-hourly traffic volumes, average traffic speeds, traffic composition and terrain. The calculated noise levels are summarized in Appendix E, Table E-1. These values (predicted noise levels without a barrier and predicted noise levels with a barrier) were used in comparison to the existing noise levels and to the NAC to determine whether noise impacts would result from the Preferred Alternative.

As can be seen from Table E-1, several values for existing traffic noise exceeded the NAC. It can also be noted that there are several cases in which the modeled traffic noise is considerably less than the existing noise. These occurrences are due in part to the fact that existing noise measurements include background noise as well as traffic noise. TNM and STAMINA only model traffic noise. In some cases, traffic on the existing road is lower in future modeled current traffic because it is diverted to the Preferred Alternative.

4.13.4 Consideration of Abatement Measures

There are three possible ways to abate traffic noise at existing receptors: change the source, change the receptor or change the noise path between the source and the receptor.

Noise from vehicles is subject to standards set by agencies such as the USEPA for engine and tire noise, vehicle noise is also subject by local law enforcement for horn and muffler noise. Traffic management measures most effective in reducing noise levels include prohibition of heavy trucks and use of lower speed limits. The prohibition of heavy trucks along this route would not be practical. Lowering the speed limit would reduce the level of service provided by the highway and thereby increase delays, air pollutant emissions, and the overall cost of transporting goods and services. Also, this would create an enforcement problem and, in light of the minor noise benefits, is not practical or reasonable.

Alteration of a receptor, moving or replacing it, is not an economically justifiable option for noise abatement.

The remaining options all deal with changing the noise path, essentially the line-of-sight, between the source and the receptor. This can be done by lengthening, interrupting it or a combination of both.

The Preferred Alternative is located in gently rolling terrain with the exception of the Des Plaines River Valley. Due to the level topography of the Project Corridor, it will be difficult to use natural terrain features as noise barriers. Every opportunity was made to depress the roadway to reduce traffic noise levels. The Preferred Alternative was depressed to an elevation within the limitations of positive drainage, stream crossings, and grade separations. Deliberately depressing the roadway may be effective in reducing the sound levels by up to 5 to 10 dB(A).

Doubling the distance between the source and receptor will decrease sound levels by only 3 dB(A). Shifting the horizontal alignment can contribute attenuation at a specific site, but requires major shifts to create a perceptible change in traffic noise levels. However, this shift could create adverse impacts to other locations in a variety of ways.

Dense woods or landscaping provide a visually pleasant noise screen and can provide up to 5 dB(A) attenuation for each 30.5 meters (100 feet) of width, provided the visual barrier is 5.5 to 6.0 meters (18 to 20 feet) high and dense. However, the additional right-of-way costs often prohibit the use of wooded noise screens. A single row of sparsely arranged trees gives little noise attenuation, but can provide a perception of noise reduction.

Noise walls or berms, or a combination of the two, placed adjacent to the roadway will attenuate traffic related noise. These barriers are the most practical and commonly used measures. The slope of berms is generally limited to a maximum 3 (horizontal) to 1 (vertical) ratio due to maintenance. Therefore, as height increases, the width of the base increases and this may interfere with the roadway drainage patterns or conflict with the physical constraints of the site. Also, additional right-of-way may need to be purchased.

Walls may provide the attenuation desired and not conflict with the drainage or spatial constraint.

When proven to be reasonable and feasible, noise wall barriers (earthen berms and noise walls) are used as noise abatement measures. An effective barrier must break the line of sight and typically extends parallel to the alignment four times the perpendicular distance to the right-of-way. Note that a minimum height for barriers is 2 meters (6 feet): this allows the wall to serve as an access control measure and as a noise abatement measure.

Refer to Section 4.19 (Construction Impacts) of this SFEIS for a discussion on abatement measures to be considered during construction activities.

4.13.5 Noise Abatement Measures

See Table 4-6 for areas near the Preferred Alternative that were predicted to experience traffic noise impacts and were analyzed for noise abatement measures. See Exhibit 4-6 for barrier analysis regions grouped by receptors.

According to the Illinois Department of Transportation's Bureau of Design and Environment Manual, Chapter 26-6.05(d) Noise Abatement, noise abatement barriers must comply with the following:

- Noise barriers shall be designed to address noise impacts to the exterior ground floor activities of abutting buildings.
- A noise barrier protecting a receptor or receptors shall reduce traffic noise levels generated on the facility by a minimum of 8 decibels at the receptor(s).
- Construction of an effective noise barrier must be feasible and reasonable.
- The total cost of a noise barrier must not exceed $24,000 per benefited residence. In this case, a benefited residence will be one that will experience a reduction of at least 5 decibels.

In the Project Corridor, noise abatement measures which are economically reasonable and feasible are considered likely for each impacted site. There are noise impacts for which no prudent solution is reasonably available. Criteria in this determination includes the physical constraint of the area, the reduction (in dB(A)) of the traffic noise levels, and reasonable economic factors. If during final design the conditions of the impact site or project substantially change, the abatement measures will be reevaluated. A final decision on the installation of abatement measure(s) will be made upon completion of the project design and public involvement.

Results of noise abatement analyses are shown in Table 4-6. These preliminary indications of likely abatement measures are based on preliminary designs for barriers at height, length, cost and noise level reduction potential as given in Table 4-6. Refer to Exhibit 4-7 for location of noise abatement measures likely to be implemented. From Table E-1, Appendix E it can be noted that certain impacted receptors displayed no decrease in traffic noise levels when a barrier was in place (receptors 32, 44, 47 and 55). This is because those receptors were located closer to busy streets and intersections than they were to the Preferred Alternative. Thus, a barrier located along the Preferred Alternative would not substantially reduce noise levels experienced at those receptors.

There is a decrease of two barriers likely to be implemented from the 1996 FEIS using 2010 traffic and the SFEIS using 2020 traffic. The noise barrier in the Receptor Group Barrier A does not meet the cost per benefited receptor criteria as per the current IDOT Noise Policy. The noise barrier in the Receptor Group Barrier C does not meet the 8 dB(A) noise reduction required per the current IDOT Noise Policy.

Table 4-6
Results of Noise Abatement Analysis

Receptor	No. of Structures Repre-sented	Barrier Height (m (ft))	Barrier Length (m (ft))	Cost ($270 per m^2 ($25 per ft^2))	Cost ($ per Benefited Receptor)	Reduction Potential (dB(A))	Likely to be Implemented	If No Rea-sons Why
Southern Section								
1**	20	4.6 (15)	369.1 (1,211)	$454,050	$15,135	8	**YES**	
2	18	4.6 (15)	299.3 (982)	$368,275	$20,459	5	**YES**	
8	5	4.6 (15)	384.7 (1,262)	$473,200	$94,640	8	NO	1
10	8	7.6 (25)	391.1 (1,283)	$801,750	$100,218	2	NO	1,2
11**	10	--	--	--	$15,135	7	**YES**	
23	20	4.6 (15)	197.5 (648)	$243,000	$12,150	1	NO	2
25	5	5.2 (17)	420.9 (1,381)	$586,650	$117,330	7	NO	1
Middle Section								
30	12	4.6 (15)	784.2 (2,573)	$965,000	$80,417	9	NO	1
Northern Section								
50*	5	4.6 (15)	979.6 (3,214)	$1,205,225	$35,447	2	NO	1,2
51*	22	--	--	--	$35,447	10	NO	1
54	1	7.6 (25)	416.7 (1,367)	$854,375	$854,375	8	NO	1
59	30	5.8 (19)	424.9 (1,394)	$662,175	$22,072	5	**YES**	
60[t]	30	--	--	--	$21,613	9	**YES**	
64*	4	--	--	--	$35,447	5	NO	1
66*	3	--	--	--	$35,447	10	NO	1
69[t]	15	7.6 (25)	474.3 (1,556)	$972,600	$21,613	11	**YES**	

Notes:
* *Receptors 50, 51, 64 and 66 share a common barrier*
** *Receptors 1 and 11 share a common barrier*
t – Receptors 60 and 69 share a common barrier
1 -- Not economically reasonable or feasible based on cost compared to benefit
2 -- Does not provide substantial noise abatement

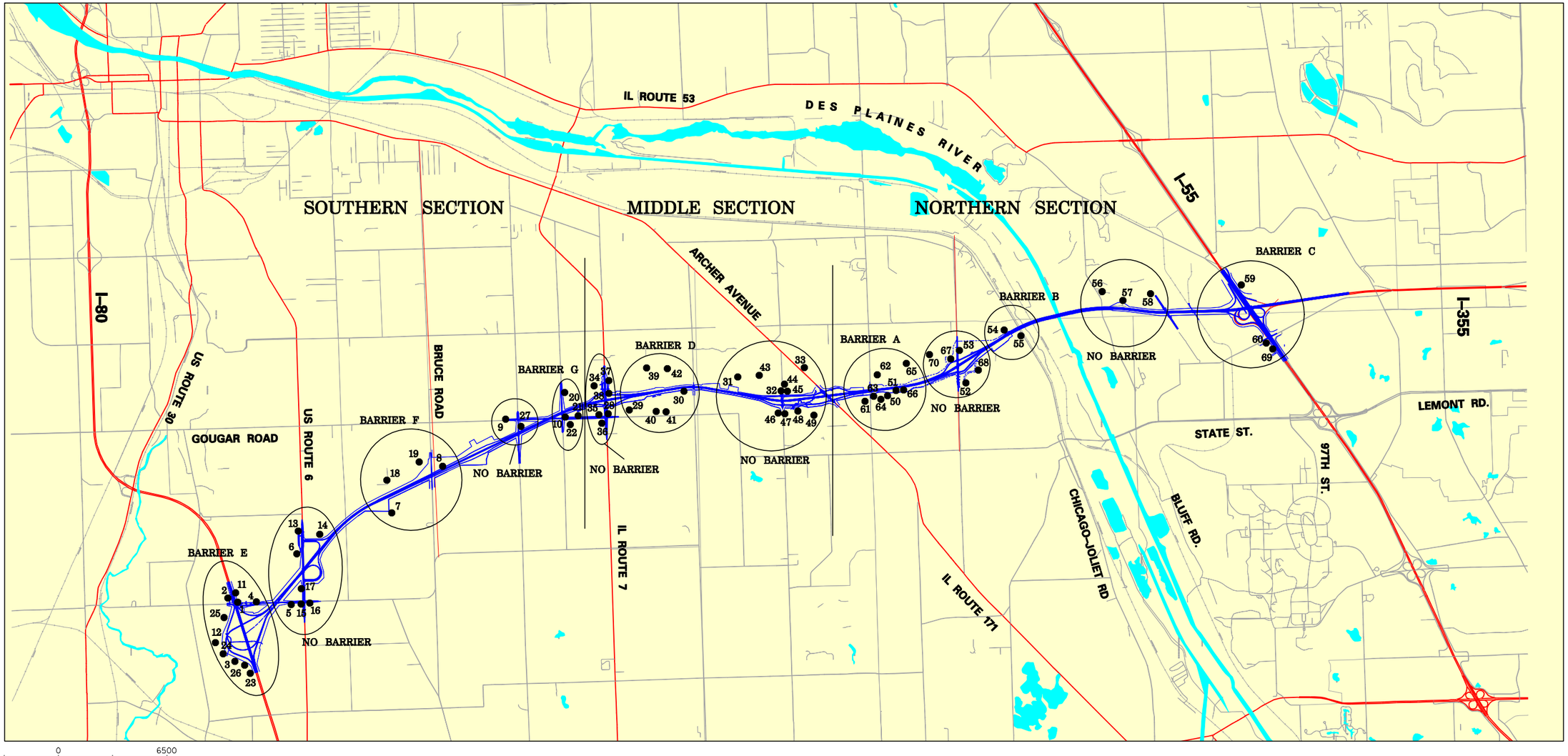

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EXHIBIT 4–6

NOISE SENSITIVE RECEPTOR BARRIER GROUP LOCATIONS

Proposed Alignment

Sensitive Receptor

Receptor Group

Receptor Group Barrier BARRIER X

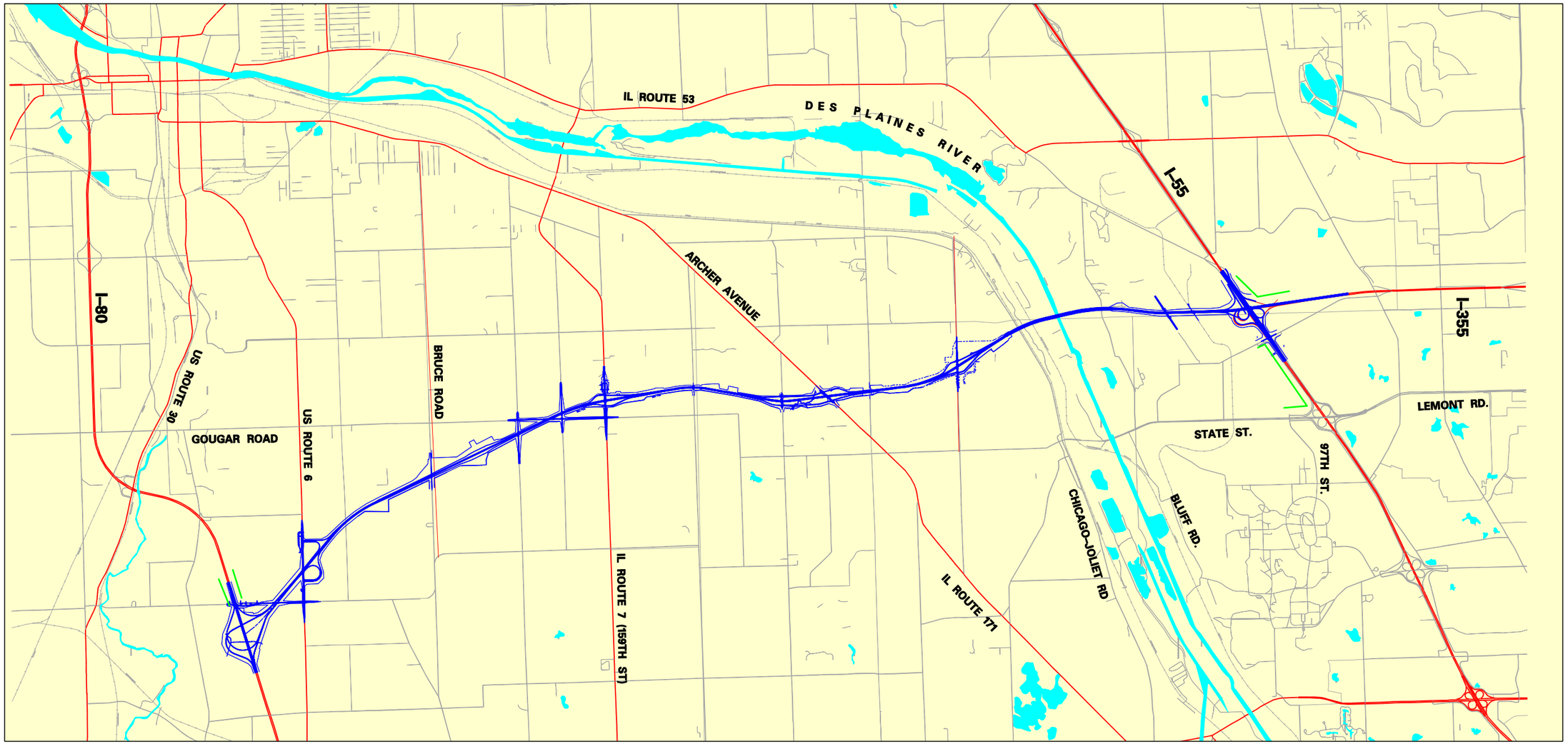

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EXHIBIT 4–7

PROPOSED NOISE ATTENUATION BARRIER LOCATIONS

Proposed Alignment ——— **Noise Attenuation Barrier** ———

This is due, in part, because the FHWA Transportation Noise Model provides better accountability for terrain information and acoustics. In addition, the 2010 noise levels predicted in the 1996 FEIS used STAMINA 2.0 which over-predicts traffic generated noise levels by 2 to 4 dB(A).

STAMINA 2.0 is believed to overpredict noise levels by 2 to 4 dB(A) based on the review of results from 5 different data sets documented in the FHWA Traffic Noise Model Technical Manual, Appendix G: Model Verification, Date: February 1998.

4.13.6 Noise Analysis for Section 4(f) Properties

There are two Section 4(f) properties located within the Preferred Alternative, the Illinois and Michigan Canal (I&M Canal) and Keepataw Forest Preserve. The Black Partridge Nature Preserve is east of the Preferred Alternative, separated by a buffer zone which minimizes potential noise impacts. Wood Ridge Forest Preserve is adjacent to the Preferred Alternative, but has no developed activities. Only Section 4(f) properties with developed activities need to be evaluated for noise impacts. This leaves the I&M Canal and Keepataw Forest Preserve to be evaluated.

The I&M Canal and Keepataw Forest Preserve will have similar noise effects caused by the Preferred Alternative. The I&M Canal is located in the industrial portion of the Des Plaines River Valley. There is no existing or proposed developed recreational activities that would be sensitive to noise increases, therefore only the Keepataw Forest Preserve was modeled for noise impacts.

Currently, the Keepataw Forest Preserve is not easily accessible due to the steep bluffs and lack of development. A small, gravel parking lot and short trail system were built in the western section of the preserve, but usage is limited. Future plans are to keep this area as natural as possible, with no plans to develop it. There are no sensitive receptors located in the Keepataw Forest Preserve and the noise analysis for this area was performed for informational purposes only.

Noise modeling has been performed in the Des Plaines River Valley specifically within the Keepataw Forest Preserve. For the Preferred Alternative, Keepataw's decibel range is from 59 dB(A) at approximately 400 meters (1,300 feet) from the centerline of the bridge to a maximum of 64 dB(A) approximately 60 meters (200 feet) from the centerline of the bridge. At about 30 meters (100 feet) from the centerline, just beyond the bridge parapet wall, the noise levels drop by 3 dB(A) due to the "shadow" effect that the elevated bridge has on the River Valley below.

4.14 Solid Waste

4.14.1 Special Waste

No substantive change has occurred since publication of the 1996 FEIS. Refer to the 1996 FEIS, Section 4.14.1 for a description of resource impacts.

4.14.2 Construction Debris

No substantive change has occurred since publication of the 1996 FEIS. Refer to the 1996 FEIS, Section 4.14.2 for a description of resource impacts.

4.15 Visual Impacts

No substantive change has occurred since publication of the 1996 FEIS. Refer to the 1996 FEIS, Section 4.15 for a description of resource impacts.

4.16 Utilities

All utilities inventoried in the 1996 FEIS have been relocated to accommodate the Preferred Alternative with the exception of a gas main at Davey Road and a Commonwealth Edison high voltage transmission tower line in the Des Plaines River Valley. The utilities relocated in the Project Corridor were constructed to accommodate the Preferred Alternative.

Impacts associated with utility relocation are fully accounted for in this SFEIS because the impacts of such relocations would occur within the right-of-way of the Preferred Alternative. For the purposes of evaluating environmental impacts, all resources located within the right-of-way limits of the Preferred Alternative were considered impacted. For this reason, all past and future utility relocations associated with the Preferred Alternative are accounted for.

The exception is the Commonwealth Edison tower line in the Des Plaines River Valley. In this case, relocating the power line will impact wetlands located outside the right-of-way. The wetland impacts caused by this utility relocation are accounted for and documented in Section 4.10.3.1 of the 1996 FEIS.

4.17 Material Resources

No substantive change in impacts has occurred to this resource since publication of the 1996 FEIS. Refer to the 1996 FEIS, Section 4.17 for a description of resource impacts.

4.18 Energy Resources

No substantive change in impacts has occurred to this resource since publication of the 1996 FEIS. Refer to the 1996 FEIS, Section 4.18 for a description of resource impacts.

4.19 Construction Impacts

No substantive change in impacts has occurred to this resource since publication of the 1996 FEIS. Regulations for construction noise found in IDOT Standard Specifications for Road and Bridge Construction, Section 107.35: Construction Noise Restrictions will be adhered to. Refer to the 1996 FEIS, Section 4.19 for a description of resource impacts.

4.20 Secondary and Cumulative Impacts

4.20.1 Approach

In addition to the direct impacts discussed above, potential secondary and cumulative have also been analyzed. These terms are defined as follows:

- *Secondary effects* are indirect impacts that are "caused by an action and are later in time or further removed in distance but are still reasonably foreseeable" (40 C.F.R 1508.8). An example is a new shopping center attracted to the vicinity of an intersection created by a new highway.
- *Cumulative effects* are "impacts which result from the incremental consequences of an action when added to other past and reasonably foreseeable future actions" (40 C.F.R 1508.7). An example is degradation of a stream's water quality by several developments which, taken individually, would have minimal effects but collectively cause a measurable negative impact.

Since publication of the 1996 FEIS, the Council on Environmental Quality (CEQ) has developed an 11-step approach (CEQ, 1997), outlined in Table 4-7, to evaluate cumulative effects. EPA (EPA, 1999) and FHWA (FHWA, 1992) guidance documents have repeated and reinforced this approach.

This 11-step CEQ approach was applied to the Preferred Alternative to identify the affected resources and to quantify potential secondary and cumulative effects. The emphasis is on important issues of national, regional or local significance. The analysis presented in this section supersedes Section 4.20, Secondary and Cumulative Impacts, of the 1996 FEIS.

This analysis also complies with the Northeastern Illinois Planning Commission (NIPC) directions for addressing direct, secondary and cumulative impacts. According to the NIPC policy, adopted on September 23, 1993 to guide planning efforts in the region, projects "should 1) properly be included in the long range transportation plan; 2) be coordinated with an intergovernmental land resource planning process covering the impacted area; and 3) be subject to a full environmental review equivalent to the requirements as presented in the National Environmental Policy Act."

NIPC has supported the formation of the Heritage Corridor Planning Council (HCPC). The Council is comprised of local governments adjacent to the Project Corridor. One of the purposes of the HCPC is to help plan for and manage development in and around the Project Corridor. To support this goal HCPC prepared the I-355 Heritage Corridor: Cumulative Effects of Local Plans in October, 1996. This document was used in the preparation of this secondary and cumulative analysis.

The organization of this section follows the 11-step CEQ approach. These steps are grouped under three environmental impact assessment components, as shown in the Table 4-7. Steps 1 through 4 address scoping, which sets the boundaries for the analysis by narrowing the focus to truly meaningful issues and the sustainability of affected resources. Steps 5 through 7 describe the affected environment (that is, its resources, ecosystems, and human communities) in terms of the stresses it experiences and its response to change, capacity to withstand stresses, regulatory thresholds and baseline condition. Steps 9 through 11 determine the environmental consequences. These last four steps include cause-and-effect relationships, magnitude and significance as well as measures to avoid, minimize, mitigate, monitor and manage the consequences. As explained in Section 4.20, this analysis has determined that the secondary and cumulative effects of the

Table 4-7
Steps in Cumulative Effects Analysis

Environmental Impact Assessment Component	Cumulative Effects Analysis Steps
Scoping	1. Identify the significant cumulative effects issues associated with the Proposed Action and define the assessment goals. 2. Establish the geographic scope for the analysis. 3. Establish the time frame for the analysis. 4. Identify other actions affecting the resources, ecosystems and human communities of concern.
Describing the Affected Environment	5. Characterize the resources, ecosystems and human communities identified in scoping in terms of their response to change and capacity to withstand stresses. 6. Characterize the stresses affecting these resources, ecosystems and human communities and their relation to regulatory thresholds. 7. Define a baseline condition for the resources, ecosystems and human communities.
Determining the Environmental Consequences	8. Identify the important cause-and-effect relationships between human activities and re sources, ecosystems and human communities. 9. Determine the magnitude and significance of cumulative effects. 10. Modify or add alternatives to avoid, minimize or mitigate significant cumulative effects. 11. Monitor the cumulative effects of the selected alternative and adapt management.

Preferred Alternative would be limited and controllable through mitigation and monitoring.

Step 1 Scoping – Identify Significant Cumulative Effects

Scoping is required to identify several potentially significant cumulative effects associated with construction of the Preferred Alternative (see Table 4-8, Potential Cumulative Effects).

Step 2 Scoping – Geographic Boundaries

The geographic boundaries for this analysis are those of the Project Corridor shown in Exhibit 1-2. This is the project impact zone, extending 6.4 kilometers (4.0 miles) either side of the Preferred Alternative. The Project Corridor is located approximately 40 kilometers (25 miles) southwest of the City of Chicago. It encompasses 310 square kilometers (120 square miles) within north-central Will County, with small portions extending into southern DuPage and southwestern Cook Counties. Its boundaries are the Will/DuPage County Line (87th Street) to the north, Spencer Road to the south, IL Route 53 to the west and Bell Road to the east.

Step 3 Scoping – Time Frame

The time frame for this analysis is the early 1960s through 2020. This time frame begins with the initial planning for a highway in the Project Corridor and extends through the end year of regional projections in the NIPC Land Use Plan.

Step 4 Scoping – Other Contributing Actions

Other actions have the potential to cause secondary and cumulative effects on the resources, ecosystems and human communities within the Project Corridor. These actions

Table 4-8
Potential Cumulative Effects

Resources/ Eco-systems/ Human Communities	Direct/Indirect Effects	Potentially Important from Cumulative Effects Perspective
Land Use	a. Planning and community interests b. Relationship between land use and transportation c. Agricultural land conversion d. Socioeconomics e. Public services – educational, medical, fire, police, places of worship, cemeteries	a. Consistency with existing land use plans b. Property purchases for right-of-way; home and business displacements; community mobility and access c. Farm and prime farmland loss d. Population and employment growth e. Growth and urban sprawl; overburdened services; community mobility and access
Water Resources	a. Wetlands b. Floodplains c. Ground and surface water quality	a. Degradation or loss (erosion, filling) b. Degradation or loss (erosion, filling) c. Sedimentation; contamination from pollutants such as salt spray from deicing chemicals; altered hydrology
Air Quality	a. Exceedance of standards for CO and other air pollutants b. Long-range transport of air pollutants c. Conformity with State Implementation Plan	a.- c. Degradation of regional air quality
Noise	Traffic-generated noise levels	Substantial increases in traffic noise over existing conditions
Cultural Resources	Historic structures and archaeological sites	Loss of resources
Sociocultural Resources	Demographics – distribution of racial, ethnic and special groups	Environmental justice
Biological Resources	a. Flora and fauna diversity b. Habitat fragmentation c. Threatened and endangered species d. Intrusion into nature preserves e. Tree loss during construction	a. – e. Degradation of habitats and populations; impacts from construction and ongoing operation

are either currently under construction or are reasonably foreseeable, given their stage of planning and development. The impacts of these actions must be considered along with those of the Preferred Alternative.

Development in the Project Corridor is quickly infilling undeveloped land currently within municipal planning boundaries and requiring annexations. Single-family homes, assisted-living residences, town homes and apartment complexes are under construction in virtually every part of the Project Corridor. New subdivisions range in size from 26 units to a proposed 1,400 unit residential development. Annexations ranging from 12 to 810 hectares (30 to 2,000 acres) have already taken place, with proposed annexations exceeding 1,200 hectares (3,000 acres) in some areas. Industrial and commercial development is also on the rise, leading to an increase in employment in Will County for the eighth consecutive year.

Other, specific actions that have been identified within or near the Project Corridor include:

- Internationale Centre. This complex of industrial and light manufacturing sites is under development to the east and west of the Preferred Alternative, just south of Interstate Route 55 between Lemont Road and Joliet Road.
- Joliet Arsenal. This facility is in the process of being transformed into a source of peacetime employment for the region, just as it was a source of jobs during periods of conflict.
- A high-speed rail facility is being planned for construction between Chicago and the St. Louis metropolitan area. To the extent that local land use planning is effective, this new service expansion could be positive for the regional economy and result in limited impacts to natural resources.
- Metra Southwest Service. A federal transportation package that apportions more than $100 million for a Metra extension to Manhattan has cleared congress. The agreement includes $35 million for planning several extensions to the commuter rail service. It also includes grant obligations that will provide $103 million over the next five years for the extension of the Southwest Service Line to Manhattan ("Metra lines get go-ahead from Congress," *Daily Southtown*, October 10, 2000).
- Chicagoland Speedway. The anticipated completion of this facility, located in Joliet off historic Route 66, is scheduled for early summer 2001. The speedway is located in Joliet off historic Route 66. The facility occupies a total of 376 hectares (930 acres) and will have a seating capacity of more than 75,000. It will bring NASCAR and Indy Racing to Chicago for the first time.
- Schools. Development within the Project Corridor includes the expansion of 13 schools and proposed or current construction of 11 new schools.
- The Lewis University Airport. This facility, south of Romeoville (along IL Route 53), is planning to add runways.
- The Argonne National Laboratory. This facility is expanding within its current enclave, which is surrounded by Waterfall Glen Forest Preserve. It is located to the northeast of the Preferred Alternative, just south of Interstate Route 55.

In addition, a new third airport, the South Suburban Airport, is proposed to the southeast of the Preferred Alternative. The South Suburban Airport produces a net population impact of 0.6 percent of the total forecasted population growth and a net employment impact of 0.1 percent of the total forecasted job growth. Therefore, the South Suburban Airport is expected to have minimal impact to the Project Corridor.

A number of these developments are likely to stimulate additional growth, resulting in impacts to the same resources in the area that would experience impacts from the Preferred Alternative. Many of the potentially affected natural resources, however, are protected by public ownership or under the regulatory authority of various state and federal agencies. Developers must coordinate their activities with the appropriate agencies and obtain the necessary permits or clearances. The agencies review the potential impacts to

natural resources (wetlands, listed species, air and water quality, etc.) as the actions are proposed.

Steps 5, 6 and 7 Affected Environment – Resources, Stresses, Current Condition

These three steps characterize the key resources, ecosystems and human communities in the affected environment in terms of the following: their response to change; stresses imposed on them; their capacity to withstand these stresses; the pertinent regulations, standards and development plans that establish thresholds (levels of stress beyond which the desired condition degrades); and their current status (baseline condition). This information is summarized in Table 4-9 Affected Environment. Taken as a whole, this table reflects trends in the affected environment as the resources, ecosystems and human communities respond to change and are subjected to various stresses within the regulatory setting. As this table indicates, regulatory measures exist to control the effects of change and protect the environment.

Step 8 Determining Environmental Consequences – Cause and Effect

The cause-and-effect relationships between the key resources, ecosystems and human communities and the various stress factors identified for the Preferred Alternative are summarized in Table 4-10. This table indicates the response of a given resource to a change in its environment.

Step 9 Determining Environmental Consequences – Magnitude and Significance

The magnitude and significance of any negative secondary and cumulative effects of the Preferred Alternative on the resources in the Project Corridor are expected to be limited and controllable. Efforts have been made to avoid and minimize impacts, and measures will be implemented to mitigate.

An important issue associated with construction of the Preferred Alternative is the development that it may induce. Currently, the Project Corridor can be characterized as suburban/rural within an urban fringe; most of the land is now zoned either agricultural or low-density residential. However, the Project Corridor is experiencing rapid growth because of market forces and its geographic location close to downtown Chicago and suburban job centers. Development is occurring in the form of infill within existing municipalities and municipal expansion through annexation. The pace of development has quickened over the past 10 years. A significant amount of agricultural land is expected to be converted to other uses, such as residential and commercial/industrial developments.

Potential Socioeconomic Effects

As reported in The Socio-Economic and Land Use Impacts of the Proposed I-355 Extension, December 2000 (Appendix A), very substantial growth is occurring regardless of plans to construct the Preferred Alternative. Projections show population and employment in the area more than doubling between 1990 and 2020.

The proposed action, alone, is expected to be responsible for only a modest amount of this growth. Specifically, it would account for only about 1.3 to 1.4 percent of the total forecasted transportation impacts in terms of population increase.

Table 4-9
Affected Environment

Resource	Response to Change	Stresses	Capacity to Withstand Stresses	Regulatory Thresholds	Baseline Condition
Planning	Increase in development, consumer services and public services	Water resources, air quality and noise pollution	Regulations and standards are used to minimize adverse effects. Development standards can require compensatory storage and natural drainage measures to mitigate effects of increased total impervious surface area. Facility Planning Areas (FPAs) help prepare for future development, with emphasis on sanitary districts.	NIPC; county and municipal zoning and planning;	Refer to Exhibit 1-6 for current land use.
Land Use and Transportation Interaction	Use of undeveloped land for new transportation facilities	Increase in population and development	The Preferred Alternative would help local governments achieve their land use goals by focusing growth within the Project Corridor and would provide a more-efficient, better-balanced transportation network that would improve access.	County and municipal zoning and planning; IDOT; ISTHA	No direct north-south interstate route exists between I-55 and I-80. Refer to Exhibit 1-8 for existing options for north-south travel.
Agricultural Land Conversion	Loss of prime farmland soils	Increase in development	No agricultural preservation lands exist within the Project Corridor.	USDA Soil and Conservation Service; Illinois Department of Agriculture; county land resource management plans	Existing farmland percentage, by county: Will County – 61% Cook County – 13% DuPage County – 9%
Socioeconomics	Increase in population and employment	Decrease in mobility, increase in travel times	Improved highway access would encourage workers to live farther away from centers of employment but also encourage employers to move into the expanding communities.	IDOT and ISTHA Guidelines for the Reimbursement of Costs Incurred in the Displacement of Residences and Businesses	Properties to be displaced as a result of the Preferred Alternative: Businesses – 3 Residences – 52
Public Services	Increase in demand for and access to education, health care, fire and police services, places of worship and cemeteries as a result of growth	Increase in population and development, which increases roadway traffic and congestion	An expanded tax base and increased revenues would help offset the costs of the increase in various services to expanding communities.	County and municipality zoning and planning; laws governing delivery of services to communities; agencies overseeing service delivery	Facilities in the Project Corridor include: Educational – 11 elementary schools, 4 high schools, 3 colleges, 1 seminary Medical –1 Cemeteries – 15 Churches – 4 Firehouses – 3 Large municipalities have full-time fire protection service; unincorporated areas depend on volunteer fire departments.

Table 4-9
Affected Environment

Resource	Response to Change	Stresses	Capacity to Withstand Stresses	Regulatory Thresholds	Baseline Condition
Wetlands	Direct impacts: loss of wetlands Indirect impacts: hydrology issues	Continued growth, development and new highway in Project Corridor	Mitigation for wetland loss would take place according to the relevant agency regulations.	IDNR, USACOE, USFWS, Federal Section 404 and Section 106 Wetland Regulations and state regulations that regulate wetland impacts.	The Project Corridor has 53.61 ha (132.42 ac) of wetlands: 16 emergent wetlands – 32.93 ha (81.35 ac) 6 unconsolidated bottom wetlands – 1.25 ha (3.08 ac) 3 farmed wetlands – 0.78 ha (1.92 ac) 11 forested wetlands – 17.91 ha (44.25 ac) 3 excavated wetlands – 0.74 ha (1.82 ac) The preferred alignment would result in wetland loss of 3.93 ha (9.7 ac).
Floodplains	Loss of floodplains	New development and highway	Stream crossings were designed not to increase the 100-year floodwater surface elevation. Impacts from construction activity and improvements on floodplains are being evaluated, and compensatory storage is being provided.	Local storm water ordinances regulate impacts to floodplains. Section 106 and Section 404 allow no impacts to floodplains without compensatory mitigation. Federal and state permits are issued through USACE, IDNR/OWR, FEMA and IEPA.	Refer to Exhibits 2-12 to 2-14, 1996 FEIS, which identify the floodplains within the Project Corridor.
Water Quality	Increase in chloride concentrations in streams	New development, salt spray, stormwater runoff, and construction and operation of the Preferred Alternative	The Preferred Alternative would use best-management practices extensively during construction to minimize pollutant and sediment concentration in stormwater runoff. New development plans must incorporate natural drainage measures as well as detention basins designed to reduce runoff pollutant loads.	All streams fall under the General Use Water Quality Standards except the Chicago Sanitary and Ship Canal, which is under the Secondary Contact and Indigenous Aquatic Life Standards. IEPA provides water quality certification under Section 401 of the Clean Water Act, which is mandatory for all projects requiring Section 404 permits. Safe Drinking Water Act protects municipal water sources from contamination.	Groundwater is the primary source of drinking water in the Project Corridor. Joliet is the only public water system that utilizes the sand and gravel deposits near the Spring Creek and the Hadley Bedrock Valley. Joliet has 7 public water wells.
Air Quality	Increase in air pollution	Increase in traffic volumes and congestion	The Preferred Alternative would reduce congestion and travel time, thereby helping compliance with standards. Construction would have a temporary adverse effect. Other adverse factors would be the stationary and mobile source emissions associated with continued development.	IEPA Construction and Operating Permits; National and State Ambient Air Quality Standards (Refer to SFEIS Table 2-16.)	Existing conditions show no exceedance days for particulate (PM_{10}), ozone, sulfur dioxide, nitrogen dioxide, lead, or carbon monoxide within the Project Corridor.

Table 4-9
Affected Environment

Resource	Response to Change	Stresses	Capacity to Withstand Stresses	Regulatory Thresholds	Baseline Condition
Noise	Increase in noise pollution	Increase in traffic volumes	Upon collection of noise data, noise protection measures would be implemented according to IDOT/ISTHA standards.	Refer to Section 4.13.2, Regulations.	Existing noise was measured at 13 representative receptor sites throughout the Project Corridor in 2000. Refer to Table 2-19 for Existing Year 2000 Noise Levels.
Cultural Resources	Preservation of historic and archaeological resources	Increase in development and new highway	The bridge over the I&M Canal National Heritage Corridor would have vertical clearance of approximately 80 feet, with piers placed on northern side of the I&M Canal right-of-way. The pier locations were considered to avoid taking property.	Historic and archaeological resources review coordinated with the ISHPO in accordance with the requirements of 36 C.F.R 800.4; Section 106 of the Natural Historic Preservation Act	Potentially significant structures in Project Corridor include I&M Canal National Heritage Corridor, Illinois and Michigan Canal, Isle à la Cache Museum, Lockport Historic District, John Lane Commemorative Marker, Swede town and numerous archaeological sites.
Sociocultural Resources	Demographic changes	Increase in population and highway development; loss of neighborhoods valued by low-income and minority populations	Protective policies provided by federal and local governments	Executive order pertaining to environmental justice; county and municipality zoning and planning.	Minority percentages, by county and township, reported by NIPC and in 1990 U.S. Census: Cook – 43% DuPage – 11% Will –18% DuPage – 22% Homer – 4% Lemont – 3% Downers Grove – 10%
Threatened and Endangered Species	Impacts to various habitats	Increase in development and new highway	A herpetologist would determine whether various turtle habitats exist within the construction limits. A biologist, botanist and ornithologist would observe the startup activities for construction. Scientists would visit the site periodically during construction.	USFWS (under Section 7 of the Federal Endangered Species Act), INDR (under the Illinois Endangered Species Protection Act), IDOT, ISTHA, and Illinois State Museums are coordinating studies on the Hine's emerald dragonfly (*Somatochlora hineana*).	Currently no impacts to Hine's emerald dragonfly habitat, but dragonfly activity to be monitored closely. Leafy prairie clover , a federally and state endangered species, observed in Lockport Prairie and Romeoville Prairie Nature Preserves. Section 2.12.3, lists Threatened and Endangered Species in the Project Corridor.

Even with the synergistic impacts of I-80, the Preferred Alternative still would contribute only 1.8 to 1.9 percent of the population growth forecasted for the 1990 to 2020 time frame. When offset by reductions elsewhere in the area, the population growth would be further reduced to a net impact of 0.3 to 0.6 percent of the projected total. Similarly, the net employment growth produced by the route is forecasted to amount to only 0.1 percent. To a large extent, these forecasted relatively minor growth impacts of the Preferred Alternative already took place between 1990 and 1998 (ACG, 2000).

Table 4-10
Cause-and-Effect Relationships for Resources, Ecosystems and Human Communities

Resource	Cause of Change	Potential Effect of Change
Land Use	Growth, accompanied by new transportation, residential, commercial, industrial and service-oriented development	Loss of prime farmland soils Severance of properties Loss of open land Employment availability Increased traffic, congestion and travel times
Water Resources	New development, with increased impervious surface area Storm water runoff during construction and operation Stream channel erosion Salt spray and other non-point source pollution Human access	Degradation of surface and groundwater More rapid, higher discharge runoff pattern Over draught of groundwater Impaired groundwater recharge rates Wetland degradation, fragmentation and loss Disturbance of hydrology Diminished flood control capacity Sediment delivery and pollutant loading Deterioration of recreational water bodies Litter and refuse deposits
Air Quality	Highway construction Traffic volumes and congestion	Increased air pollution from vehicle emissions
Noise	Traffic, human access	Increased locally specific noise pollution
Cultural Resources	Right-of-way acquisition Stream bank erosion Land leveling and construction Vandalism	Cultural site degradation Fragmentation of historic districts
Socio-cultural Resources	Right-of-way acquisition Traffic noise	Environmental justice implications for minority and low-income groups residing in higher-density neighborhoods inside the corridor Disruption of community mobility Loss of neighborhoods or community character
Biological Resources	Highway construction Urban development	Habitat fragmentation and loss outside of protected areas such as nature preserves, natural areas and parks Impacts to state and federally listed species known to exist within the Project Corridor Loss of biological diversity; introduction of pest species Degradation of sensitive ecosystems Detrimental effects on food chains

Rather than stimulating uncontrolled growth, the Preferred Alternative is expected to have a positive influence on the Project Corridor. Considerable planning has taken place on both the regional and local levels. Planning for this highway in the Project Corridor began in the 1960s and has continued intermittently for over 30 years.

The current long-range transportation plan for northeastern Illinois, 2020 RTP, also designates the highway as an approved but yet-to-be-constructed facility. Its predecessor, the 2010 Transportation System Development (2010 TSD) Plan, adopted in 1989, also included the route as a vital element in the regional transportation network.

Further, NIPC policy states, "For major expressway or transit facilities the region should work to develop appropriate and reasonable local intergovernmental land resource planning agreements and development standards covering the impacted area. The develop-

ment standards would be applicable to both the project implementer and local governments. These agreements and standards should give full consideration to the management of land use density consistent with the provision of transportation infrastructure." The local communities that administer land use controls have followed this policy. Their planning documents are aimed at guiding new development to meet the regional land use planning goals in the Strategic Plan for Land Resource Management (Northeastern Illinois Planning Commission, June 1992). Controls are already in place, to varying degrees, in the local comprehensive plans, zoning ordinances, development standards, subdivision regulations and similar documents.

The Heritage Corridor Planning Council (HCPC) provides additional control in that the participating governments have agreed to cooperate in planning for and managing development within the Project Corridor.

While allowing for considerable growth, the existing local plans promote contiguous, urbanized growth in northern Will County. Over 75 percent of the Project Corridor is planned for residential and commercial/industrial development; none of the land is designated as agricultural or undeveloped at build-out development levels. Exhibit 1-7 in Chapter 1 depicts the progression of past, present and future planned land use within the Project Corridor. The conversion of various land uses to transportation right-of-way for the Preferred Alternative, and the future loss of agricultural land, are a direct (rather than secondary or cumulative) impact of building the Preferred Alternative, as documented in the 1996 FEIS.

In sum, the area will be greatly modified by human activities in the foreseeable future, whether or not the Preferred Alternative is built. Local planning is already in place to optimize the growth that is taking place, and the Preferred Alternative is in harmony with the existing plans. The land use plans adopted by Will County and local municipalities expect construction of the Preferred Alternative to have a beneficial influence on the development patterns of adjoining land. While generating small population and job growth, the highway would be useful in consolidating the ongoing development. It would manage growth by concentrating high-density commercial and industrial development adjacent to the highway, while residentially zoned land would be located farther away. In addition, the Preferred Alternative would eliminate many scattered work trips to areas outside the six-county region and to the job-scarce areas of south Cook County and the south side of the City of Chicago, with resulting economic benefits.

Potential Impacts to Biological Resources

Considering that the growth trend in the Project Corridor is occurring rapidly without the Preferred Alternative, the biological resources are currently experiencing impacts will continue to do so whether or not the route is constructed. Therefore, the Preferred Alternative is expected to have only limited cumulative effects on biological resources are detailed in the following subsections.

Step 10 Determining Environmental Consequences – Alternatives and Measures to Avoid, Minimize, or Mitigate Effects

The 20.1 kilometer (12.5 mile) Preferred Alternative comprises various land uses, including residential, commercial/ industrial, agricultural, parks/forest preserves, and open lands. When the alignment, of the Preferred Alternative, was developed, several environmental issues were considered that influenced the route locations. Among the environmental constraints analyzed were the potential for involvement with Section 4(f) land and Section 6(f) property, avoiding and minimizing the filling of wetlands and floodplains, and avoiding impacts to Section 106 properties eligible for inclusion in the National Register of Historic Places. Other factors affecting the Preferred Alternative were also studied, namely housing and business displacements, severance of prime farmlands, and community interests. The alignment development process was based on the philosophy of avoidance first, minimization second and mitigation last.

Avoidance

Alternative alignments were investigated to avoid wetlands. Refer to Section 5.4, Summary of Alternate Alignments to Avoid Section 4(f) Property Impacts, in the 1996 FEIS for a detailed explanation of how the Preferred Alternative alignment was shifted to avoid Section 4(f) property. Preferred Alternative was shifted east to avoid sensitive wetlands near 143rd Street, but wetlands could not be avoided completely. The Preferred Alternative would affect about 3.93 hectares (9.7 acres) of wetlands, which would be mitigated as discussed below. Refer to Section 4.23.3, Wetlands, in the 1996 FEIS for a full discussion of wetland mitigation in the Project Corridor.

Minimization and Mitigation

Commitments are measures adopted to minimize harm to the environment. These measures can be divided into two groups: standard and specific measures. Standard measures are those required by law, regulations or policies of jurisdictional government agencies. Permits fall into this category. Specific measures, or other commitments, are project-specific actions that have been determined to be necessary or appropriate, or have been agreed to based on discussions with an interested party to address a particular need.

The standard measures are as follows:

- A permit from the U.S. Coast Guard would be required for the crossing of the Chicago Sanitary and Ship Canal.
- Construction of the Preferred Alternative would involve wetlands, floodways, and waterways and would require both federal and state permits. IEPA provides water quality certification pursuant to Section 401 of the Clean Water Act. This certification is mandatory for all projects requiring a Section 404 permit.
- A Memorandum of Agreement (MOA) has been prepared that outlines the procedures that ISTHA would follow to address the impacts to the Lustron House. Coordination efforts with the SHPO are underway to update the MOA. Alternative mitigation measures are being drafted for review and approval by IHPA to complete the Section 106 process.

- Because more than 2 hectares (5 acres) of land would be under construction for the Preferred Alternative Project, a National Pollutant Discharge Elimination System (NPDES) construction permit would be processed through IEPA. This permit application would require an erosion control plan.
- The Erosion Control Plan would identify erosion control measures to be implemented. Erosion control procedures would be followed as set forth in Section 107.23 of the Illinois State Toll Highway Authority Standard Specification.
- Keepataw Forest Preserve was purchased using Land and Water Conservation Funds (LAWCON). Therefore, the property purchased for highway right-of-way must be replaced with property of at least equal market value and similar utility.

Specific measures or other commitments are as follows:

- The Preferred Alternative project was coordinated with the U.S. Fish and Wildlife Service (USFWS) under Section 7 of the Federal Endangered Species Act (1973, as amended) and with the IDNR under the Illinois Endangered Species Protection Act. IDOT, ISTHA, Illinois State Museum and USFWS are cooperating on studies for the Hine's emerald dragonfly in the Des Plaines River Valley.
- A salt spray study was initiated as a result of commitments made in the 1996 FEIS and the lack of relevant air dispersion models (Illinois State Water Survey, supported by IDOT and ISTHA, "Atmospheric Dispersion Study of Deicing Salt Applied to Roads: First: First Progress Report"). The study will eventually develop an air dispersion model to predict the atmospheric dispersion of salt spray and its ultimate deposition. Completion of the first phase of the study has produced salt spray sampling data that can be used to estimate salt dispersion rates downwind of the roadway. (See the discussion of monitoring in Step 11, below, for more detail.)
- A water quality monitoring program for Black Partridge Creek was begun in January of 1994. The intent is to conduct water quality monitoring before, during and after construction of the Preferred Alternative in Black Partridge Creek and its tributaries.
- During the design phase, tree mitigation plans would be submitted to the Forest Preserve District of Will County for comment. Tree mitigation would consist of two components: the planting of replacement seedlings on property owned and managed by the Forest Preserve District of Will County, and the planting of non-seedling trees along the Project corridor or crossroads as appropriate.
- Native grass seed mixtures would be used, as appropriate, on the back slopes of ditches and the infields of interchanges.
- Mowing restrictions would be implemented adjacent to forested areas as a measure to minimize cowbird parasite activities. These restrictions would apply to the backslopes of ditches.
- A pay item in the construction contract for exploratory trenches would allow a contractor to locate drainage field tiles prior to major earthwork.

- "No Intrusion" fences would be erected to restrict construction activities between the Chicago Sanitary and Ship Canal and Bluff Road. A "No Intrusion" fence would also be used to prevent the contractor from operating closer to the Black Partridge Nature Preserve than the required right-of-way. Similar fences would be used to prevent disturbance to environmentally sensitive areas.
- A herpetologist would be employed to determine if the primary range of the spotted turtle and Blandings turtle is outside the construction limits before construction begins. If spotted turtles are found within the construction limits, then appropriate action would be taken based on the herpetologist's recommendations. In addition, a biologist, botanist, and ornithologist would be retained by ISTHA to observe construction startup activities adjacent to and within local forest preserves. The scientists would visit the site periodically and report all findings directly to ISTHA.

Refer to Section 6.5, Commitments, of the 1996 FEIS for more detail regarding the above items.

The mitigation to be implemented for wetland loss depends on which agency regulations are specified for that location. IDNR, IDOT and ISTHA have made an agreement to follow the Administrative Rules for the Interagency Wetland Policy Act. The wetland mitigation required by IDNR was determined using on-site (within 1.6 kilometers (one mile) of the Project Corridor) and off-site (more than 1.6 kilometers (one mile) from the Project Corridor) mitigation ratios. The mitigation ratios range from 1.5 to 5.5 for on-site wetlands and from 2.0 to 5.5 for off-site wetlands. The mitigation required by the U.S. Army Corps of Engineers is a ratio of 2:1 for forested and 1.5:1 for emergent, farmed, excavated and unconsolidated bottom wetlands. Three locations will be developed for wetland mitigation: Spring Creek (west of Gougar Road), Lockport Prairie Nature Preserve (completed) and Spring Creek (east of Gougar Road). (See Appendix D for letter confirming completion of the Lockport Prairie Site.)

Mitigation for the effects of secondary and cumulative impacts can be in the form of new conservation easements and commitments to protect "open lands" areas. IDOT and ISTHA are working with the Heritage Planning Council in an effort to bring about sound land use planning and controlled development within the area of the highway corridor. While land use decisions and growth containment are a function of the local and regional land use planners, IDOT can make recommendations and provide information to the Heritage Planning Council.

Step 11 Determining Environmental Consequences – Monitoring of Cumulative Effects

Three monitoring programs are in effect for the corridor: water quality, salt spray and Hine's emerald dragonfly management and recovery. These ongoing programs will produce a conclusion based on analysis prior to, during, and following construction.

The purpose of the water quality study is to monitor the water quality and aquatic biota in Black Partridge Creek. The water quality parameters that are being measured include those most often associated with highway runoff (turbidity, total dissolved solids, chloride and heavy metals) and those that sustain aquatic life (dissolved oxygen, water tem-

perature and pH). A fish and macroinvertebrate inventory will be conducted periodically to determine the population size of various fish including the mottled sculpin. Results from the monitoring program will be coordinated with the Forest Preserve Districts of Cook, DuPage and Will Counties. Refer to Section 4.10, Water Quality and Water Resources, of the 1996 FEIS for more explanation.

The salt spray study underway will result in development of an air dispersion model to predict the atmospheric dispersion and ultimate deposition of salt spray. Key components being studied include the mass emission to the atmosphere (particularly as a result of vehicle traffic), the size distribution of the emitted salt droplets and the concentration and size of these droplets at varying distances from their source. Five sampling sites have been constructed to establish salt aerosol concentrations prior to construction and to monitor concentrations during and after construction. Sites 1 and 2 are located along the I&M Canal 50 meters (160 feet) and 328 meters (1,080 feet), respectively, east of the proposed bridge location. Sites 3 and 5 are located on Citizens Utility of Illinois property. Site 4 is located within the Woodbridge Forest Preserve of the Forest Preserve District of DuPage County. Also, snow sampling was taken at two locations: one on the north side and the other on the south side of I-55 in northwest Romeoville. Refer to Section 4.10.2.3, Maintenance (Deicing Chemicals) Impacts, of the 1996 FEIS for more detail.

The Preferred Alternative is not likely to adversely affect the Hine's emerald dragonfly. The pre-construction studies were conducted to monitor dragonfly activity over existing roadways adjacent to known dragonfly population sites, identify larval locations and biology, and some mark and recapture work. The pre-construction studies were used by USFWS to formulate an opinion to the projects affects on the dragonfly. Studies will be performed during the construction phase and post construction phase. In order to further the knowledge of the dragonfly's biology. On October 3, 1995, IDOT sent copies of the dragonfly study for the first season to USFWS and IDNR, with the conclusion of no impact. The USFWS approved the study on November 13, 1995 (see Appendix B in 1996 FEIS under Fish and Wildlife Service) and IDNR approved the study on December 1, 1995 (see Appendix B in 1996 FEIS under Illinois Department of Conservation). Refer to Section 4.11.3.1, Federally Listed Species, of the 1996 FEIS for a more detailed discussion of the Hine's emerald dragonfly.

4.20.2 Conclusion

To conclude, the Study Area is undergoing rapid population and employment growth. This growth is projected to continue to year 2020. County and municipal governments within the Project Corridor have planned for this growth and have adopted land use plans that designate over 75 percent of the Project Corridor for development. The remaining lands are protected park and preservation lands. The local governments have formed the HCPC to manage the growth and associated impacts.

The proposed action combined with other federal actions and local economic development efforts would act to promote growth and development within the Project Corridor. However, the portion of future growth attributable to the proposed action is low, amounting to 0.6 percent of population and 0.1 percent of employment growth within the Study

Area. Therefore, the mitigation discussed herein would be commensurate with the secondary and cumulative impacts projected for the proposed action. No additional mitigation would be required.

4.21 Short-Term Use and Long-Term Productivity Relationship

No substantive change in impacts has occurred to this resource since publication of the 1996 FEIS. Refer to the 1996 FEIS, Section 4.21 for a description of resource impacts.

4.22 Irreversible and Irretrievable Commitments of Resources

No substantive change in impacts has occurred to this resource since publication of the 1996 FEIS. Refer to the 1996 FEIS, Section 4.22 for a description of resource impacts.

4.23 Summary of Mitigation Measures

4.23.1 Noise

To minimize noise impacts from normal operations to sensitive areas, noise walls will be constructed. The locations of the noise walls will be as determined in Section 4.13. As explained therein, noise walls will be built where determined to be economically reasonable and feasible.

Two noise walls were removed from the results presented in the 1996 FEIS due in part to two factors: The IDOT Noise Abatement Policy has been updated since the 1996 FEIS and the Project Corridor was modeled on FHWA TNM rather than FHWA Stamina 2.0/OPTIMA. It has been proven that Stamina 2.0/OPTIMA overpredicts noise levels by 2 to 4 dB(A), thus TNM was used to model the project. The two noise walls did not attain the current IDOT criteria for noise reduction or for economic reasonableness.

It will be the responsibility of all contractors of the Preferred Alternative to determine and comply with the limitations imposed by local ordinances with respect to construction operations, equipment noise and working time restrictions.

4.23.2 Relocation

No substantive change in impacts has occurred to this resource since publication of the 1996 FEIS. Refer to the 1996 FEIS, Section 4.23.2 for a description of resource impacts.

4.23.3 Wetlands

As with the 1996 FEIS, the wetland mitigation for the project occurs in three different areas. The first area will be along Spring Creek and satisfies Section 404 of the Clean Water Act; the second area occurs within the Lockport Prairie Nature Preserve and satisfies agreements with the U.S. Fish and Wildlife Service and the Forest Preserve District of Will County; and the third area at a location along Spring Creek, east of Gougar which satisfies the remaining requirements according to the Illinois Interagency Wetland Policy Act of 1989.

The total acreage and location of mitigation remains unchanged from that negotiated in the 1996 FEIS for the Spring Creek and Lockport Prairie sites. However, total mitigation acreage required changed due to the decrease in the total wetland acres impacted by the Pre-

ferred Alternative and a change in the replacement ratios used to calculate total mitigation acreage (Table 4-2).

The first area is the 6.68 hectares (16.5 acres) mitigation area within the Spring Creek floodplain that satisfies federal requirements through the Army Corps of Engineers (ACOE), which will replace the function and value of the 3.93 hectares (9.70 acres) of impacted wetlands. ISTHA will transfer to the FPDWC, in fee, that property acquired and developed by the ISTHA for wetland mitigation at the Spring Creek site.

The second area for the wetland mitigation is located in the Des Plaines River Valley within the Lockport Prairie Nature Preserve. The restoration area of the Lockport Prairie site is approximately 6.07 hectares (15.0 acres); however, only 25 percent was credited for mitigation, approximately 1.52 hectares (3.75 acres). This work has been completed and approved by ACOE, USFWS and FPDWC. (See Appendix D for letter confirming successful completion of the Lockport Prairie site.)

The third area of the wetland mitigation for the Preferred Alternative relates to state level regulations. IDOT, ISTHA, FPDWC and IDNR are working together to develop the third mitigation area along Spring Creek east of Gougar Road. The additional 1.8 hectares (4.5 acres) of on-site mitigation will be located there.

4.23.4 Landscaping

No substantive change in impacts has occurred to this resource since publication of the 1996 FEIS. Refer to the 1996 FEIS, Section 4.23.4 for a description of resource impacts.

4.23.5 Park lands

No substantive change in impacts has occurred to this resource since publication of the 1996 FEIS. Refer to the 1996 FEIS, Section 4.23.5 for a description of resource impacts.